

## Development of a Casting Process for Ultra-Large Vehicular Components

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### Abstract

The objective of this three year program starting in June will be to develop a process for casting ultra-large aluminum vehicle components that significantly reduces cost below current levels and achieves major weight reduction. A single production cell using the developed casting process must be capable of producing 100,000 units per year. Cost reductions will result from 1) the consolidation of a multipart assembly into a single cast component and 2) development of a more cost effective casting process. The program will include conception and development of a metal mold casting process as well as selection, design and analysis, culminating in product evaluation of a demonstration cast component. An economic model based upon the process is being developed and will be combined with a market analysis to establish the complete automotive business opportunity. Three process concepts are being evaluated through the use of proprietary thermal/fluid modeling capability currently used to optimize Alcoa casting processes. The Alcoa Technology Center will lead the project and provide resources in component design/analysis, thermal/fluid modeling of the casting process, conducting process economics and market assessment as well as conduct the demonstration trials. Chrysler Technology Center is participating on the program to select the demonstration component, provide structural performance requirements, participate in the design and analysis of the component in addition to the specification of the performance testing evaluation. In addition, DBM Industries will be responsible for the design and construction of the caster equipment and CMI will provide assistance throughout the project. Technical and commercial personnel in the Alcoa automotive business units will also be involved.